

# CATASTROPHIC INCIDENT PLANNING

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# MY INTENTION

## Three Themes

How catastrophes are special disasters

- Models of Cascadia subduction Zone Eq
- Nature of catastrophes

Catastrophic disaster planning in WA

- Over and above current planning

NGOs & WA response

# CATASTROPHIC INCIDENT PLANNING

## What is a Catastrophic Incident?

Most catastrophes will meet a lot of the criteria below:

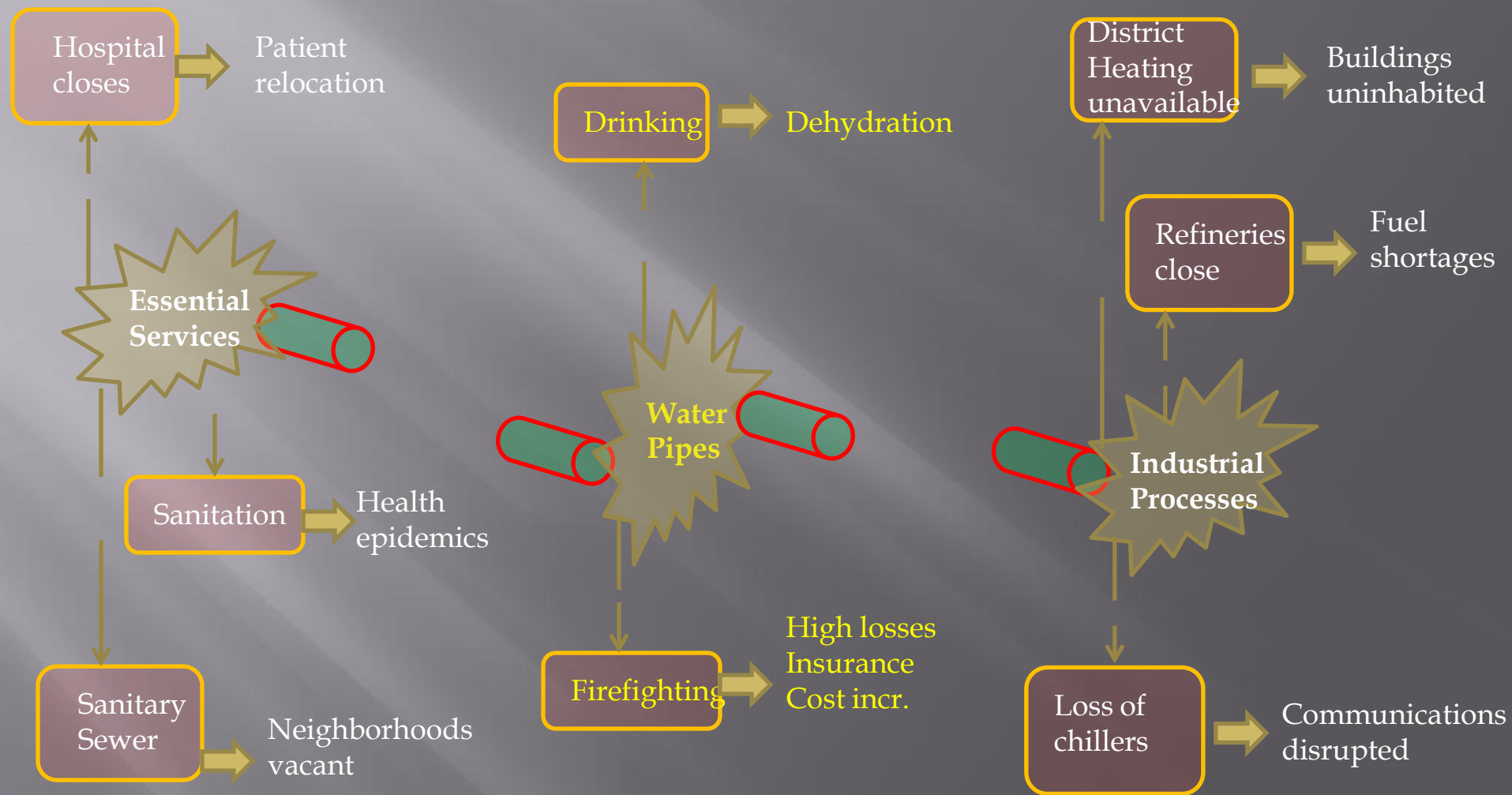
- Impact many social/economic sectors simultaneously
- Overwhelm jurisdictions with requirements
- Result in fewer available response resources
- Prompt unusual state/local response activities
- Engage major portions of state/local governments
- Result in major federal response
- Have broad impacts lasting decades (new normal)

# Effect of Catastrophic Incident - Loss of Basic Infrastructure (water distribution piping)

## Follow-on Effects - Services

## Direct Effect & Losses

## Follow-on Effects - Industrial



# Catastrophic Incident Planning

Doesn't a catastrophic disaster just need more?

Yes – and no... for example:

- We need a lot of help, but help can't get here
- When help arrives, there's a problem getting food, fuel, sanitation & security
- We need to streamline & organize regionally
- Responders want priority for local shipments, but that is done at the state level
- You need to coordinate with the state for some resources – but we've never done that before

# CATASTROPHIC INCIDENT PLANNING

## The 'specialness' of Catastrophic Planning

These disasters uncommon in WA

- Unfamiliar routines and requirements
- Staffing not considered

Agency planning for catastrophic disasters rare

- Some do but not many

Plans require crossing existing boundaries

- Interjurisdictional
- Partnerships (interagency)

Success requires non-centralized response

- Public/private partnership

# CATASTROPHIC INCIDENT PLANNING

## Cascadia Subduction Zone (CSZ) Scenario

- This is the most significant potential catastrophic incident in Pacific NW:
  - Modeled by FEMA study (HITRAC)
  - Rupture of approximately 800 mi. long Cascadia Subduction Zone geologic fault
  - 4+ minute shake @ 6.2 & higher throughout Puget Sound Area (9.0 on fault) [*Tohoku shake lasted 6 minutes*]
  - Tsunami waves w/ heights of 30+ ft wash over Pacific Coastal areas

# Visualizing relative scale

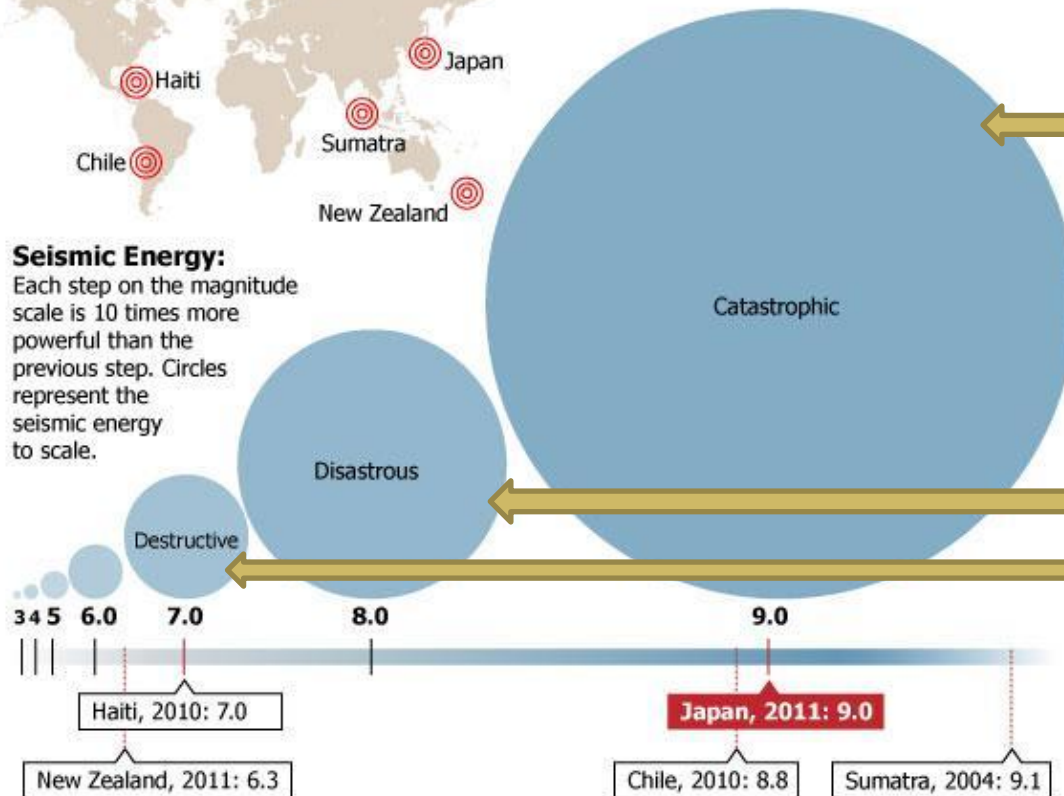
## Magnitudes of Recent Earthquakes

The earthquake off the east coast of Honshu, Japan's largest island, was the fifth-largest ever recorded, according to the U.S. Geological Survey (USGS), and the largest ever recorded in Japan. How it compares in magnitude with other major earthquakes:



### Seismic Energy:

Each step on the magnitude scale is 10 times more powerful than the previous step. Circles represent the seismic energy to scale.

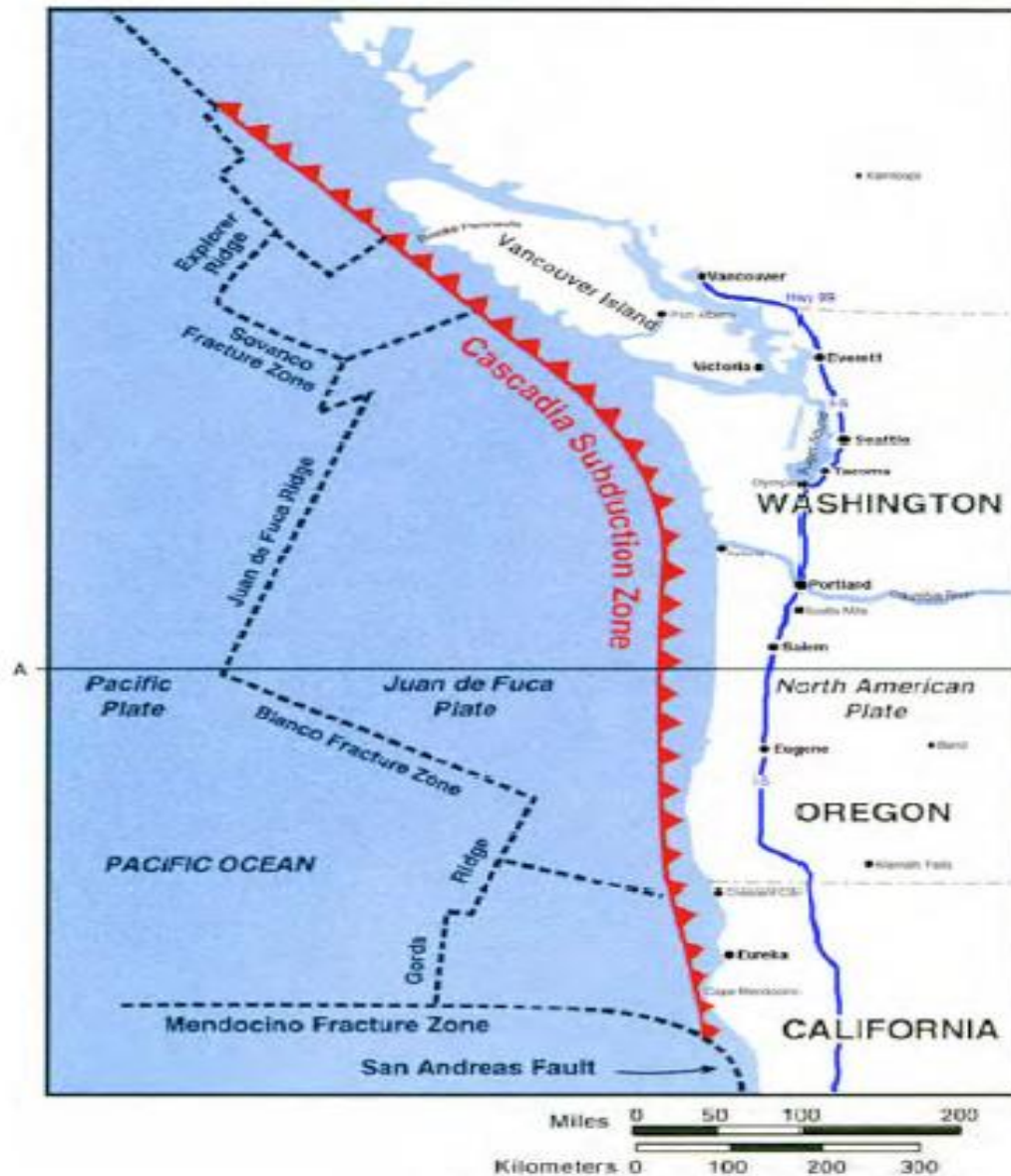


Catastrophic

Disastrous

Destructive

# Cascadia Subduction Zone



# CSZ Disaster

## Primary Effects of CSZ earthquake

- Thousands killed by tsunami & building collapse
- Up to hundreds of thousands sheltered initially
- Severe damage to every transportation mode
- Power failure across all of Washington
- Comms degraded & get worse over time
- Likely 10s of thousands of structures damaged and destroyed across every sector (res.,com'cl,ind.)
- Damage to pipeline systems
- Failure of some aboveground storage tanks
- Liquefaction damage to buried utilities
- Ocean Shores, Hoquiam & other Pacific coastal communities very heavily damaged

# Liquifaction

soil becomes a viscous liquid



# Modeling is 'chance of damage'

## Roads at 50% & 90%



# Most likely case (50%) 1<sup>st</sup> Responders



Fire Stations



Police Stations

# Healthcare - 50% & 90%



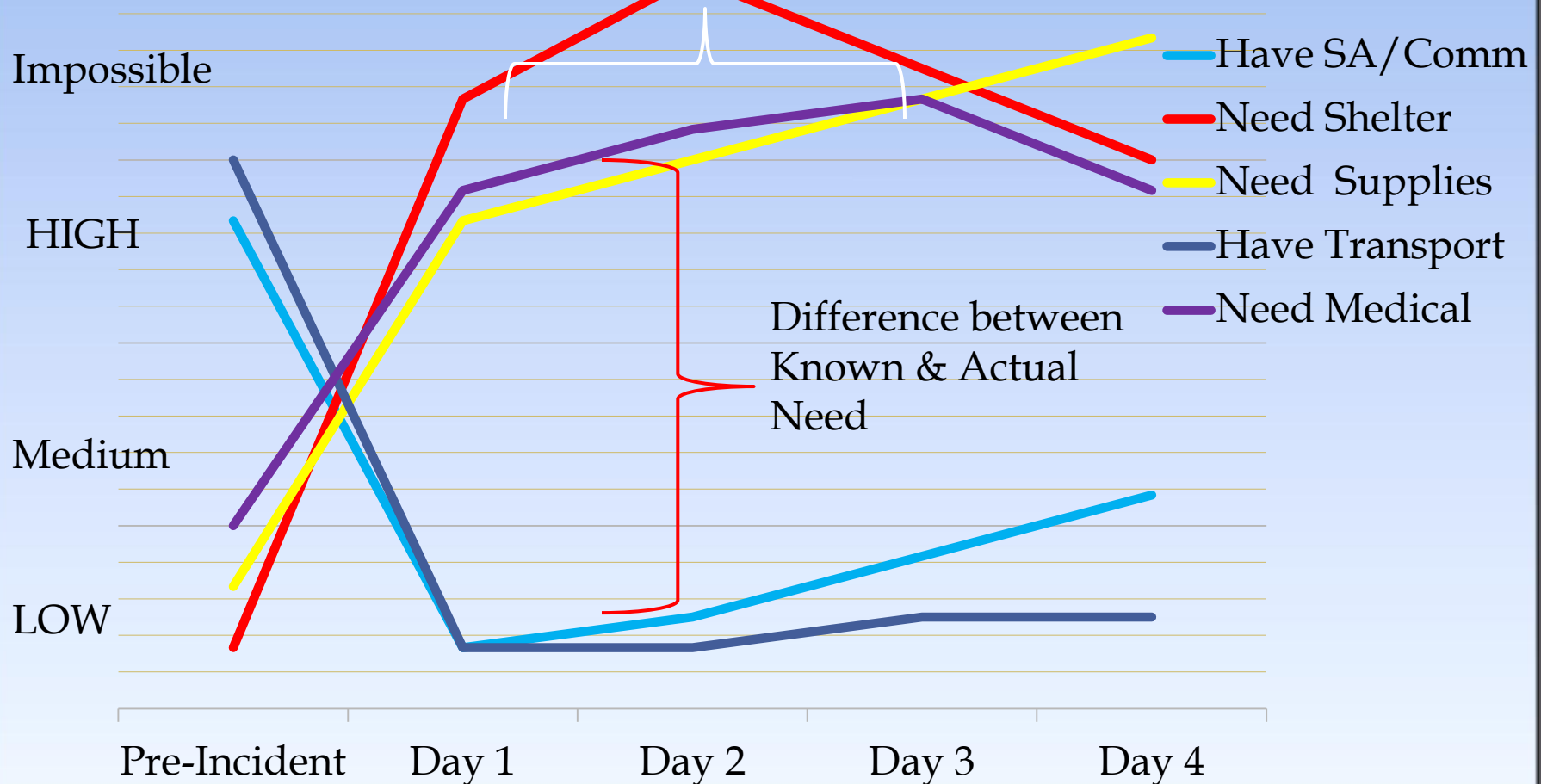
# CSZ Disaster

## Secondary Effects impacting Response

- Regional isolation due to landslides/road damage
- Local mutual aid inadequate/ doesn't come
- Health systems adjust for loss of capacity, added patient load & to maintain care where possible
- Loss of potable water closes hospitals & refineries
- Prioritize available resources due to shortfalls
- Persistent loss of power in western WA
- Localized food deserts & supply shortages
- Fuel rationing
- Increase organizational complexity & liaison
- Situational awareness not immediately available
- Immediate response by federal agencies

# Catastrophic Planning- Why PUSH supplies

**MINIMUM Time for supplies request to delivery**



Capacity  
Or Need  
Ranges

EM - Surprised  
Task-Saturated  
Ineffective  
Shortfalls

EM - Exhausted  
Task-Saturated  
More Effective  
Revise Priorities

EM - Pacing  
staff  
Task-Saturated  
More Effective  
Revise Priorities

# Scale affects EVERYTHING

More, sure AND done different to succeed

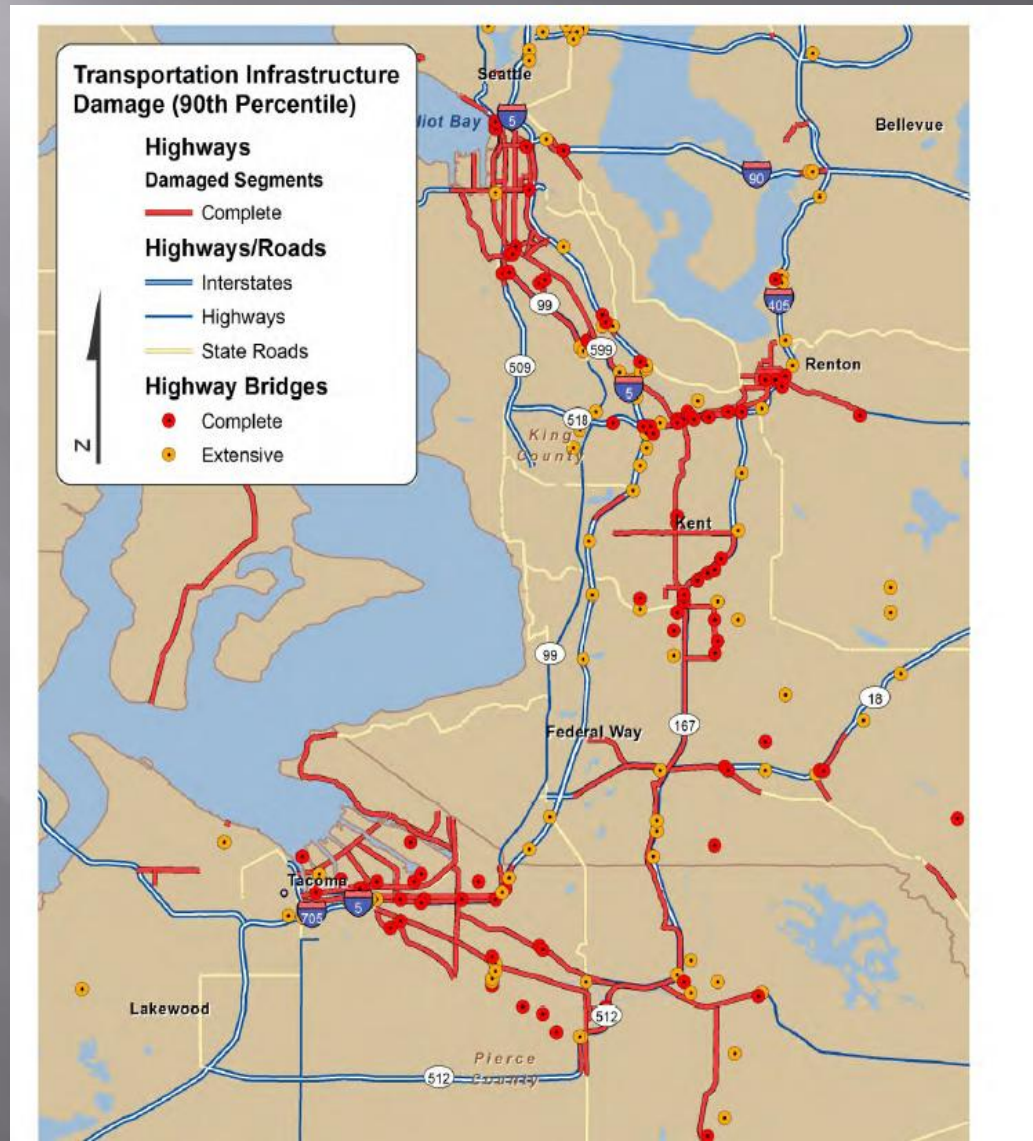
- Severe local gaps prompt Area Commands
- Many seek emergency shelter, BUT at ad hoc sites
- Medical service demands high AND facilities close
- Lack of power/fuel/transportation requires rationing
  - Fuel apportionment dilemmas severe (cell tower v.s. shelter)
- Response staging and evacuation centers in E. WA
- Repatriations & self-evacuations

# CATASTROPHIC INCIDENT PLANNING

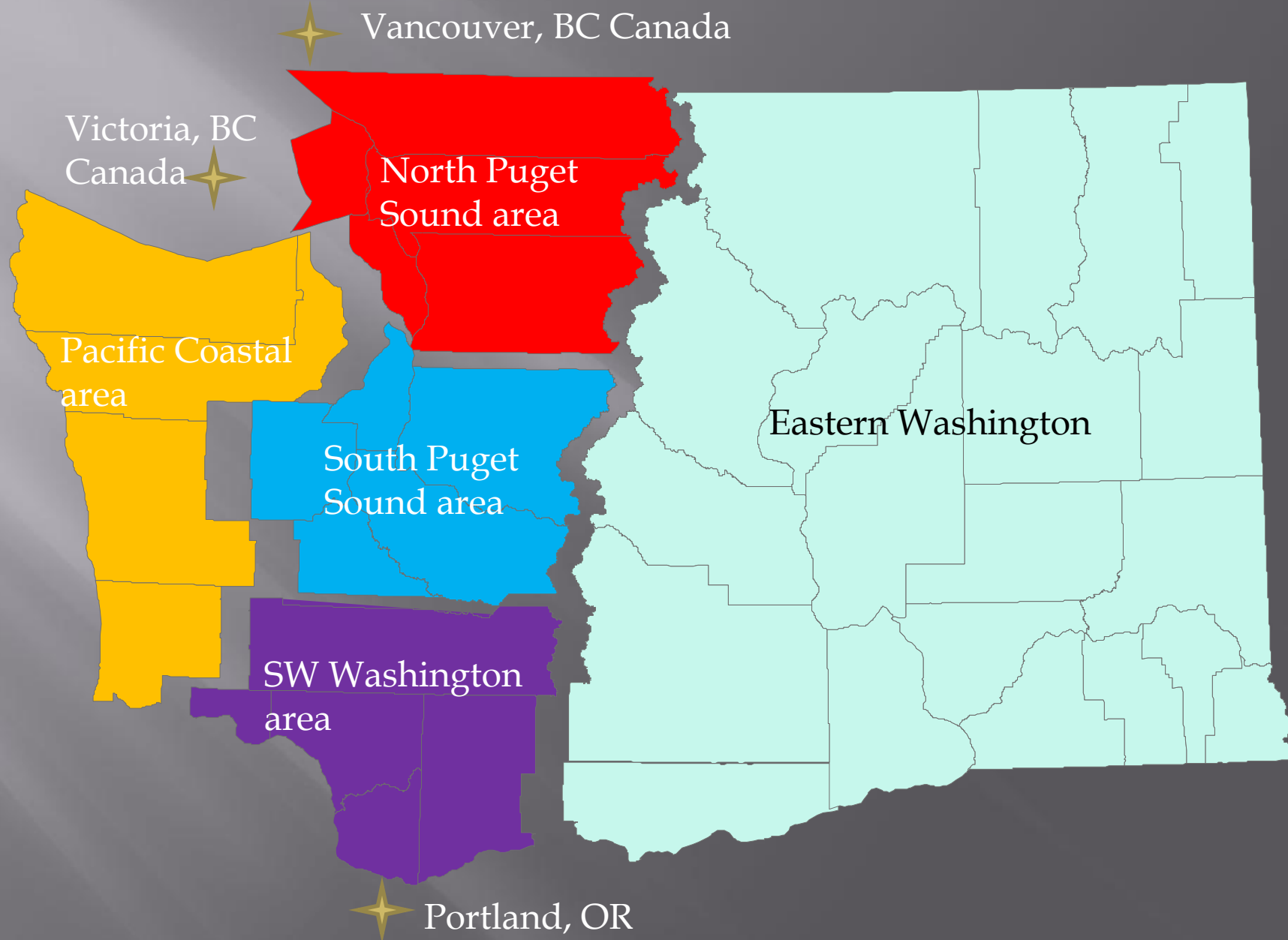
## What is the planning requirement?

- Anticipate unusual partnerships and/or actions
- Develop contingency procedures
  - Checklist-level
  - Coordinate with Federal, Tribal, State, Local & Private
  - Identify priorities and decisions
  - '70% solution' for Response actions
  - Inform, collaborate, evaluate & exercise

# Sea-Tac roads & bridges 90%



# CSZ PLANNING with FEMA



# Silos of Excellence

Are beneficial to all of us:

- Prevents us from having to do everything
- Allows us to focus
- Permits specialization and acquisition of expertise

Depend on availability of underlying utilities and services

- Delivery of goods, material and personnel
- Communications with organization & clients
- Delivery of power, fuel, water

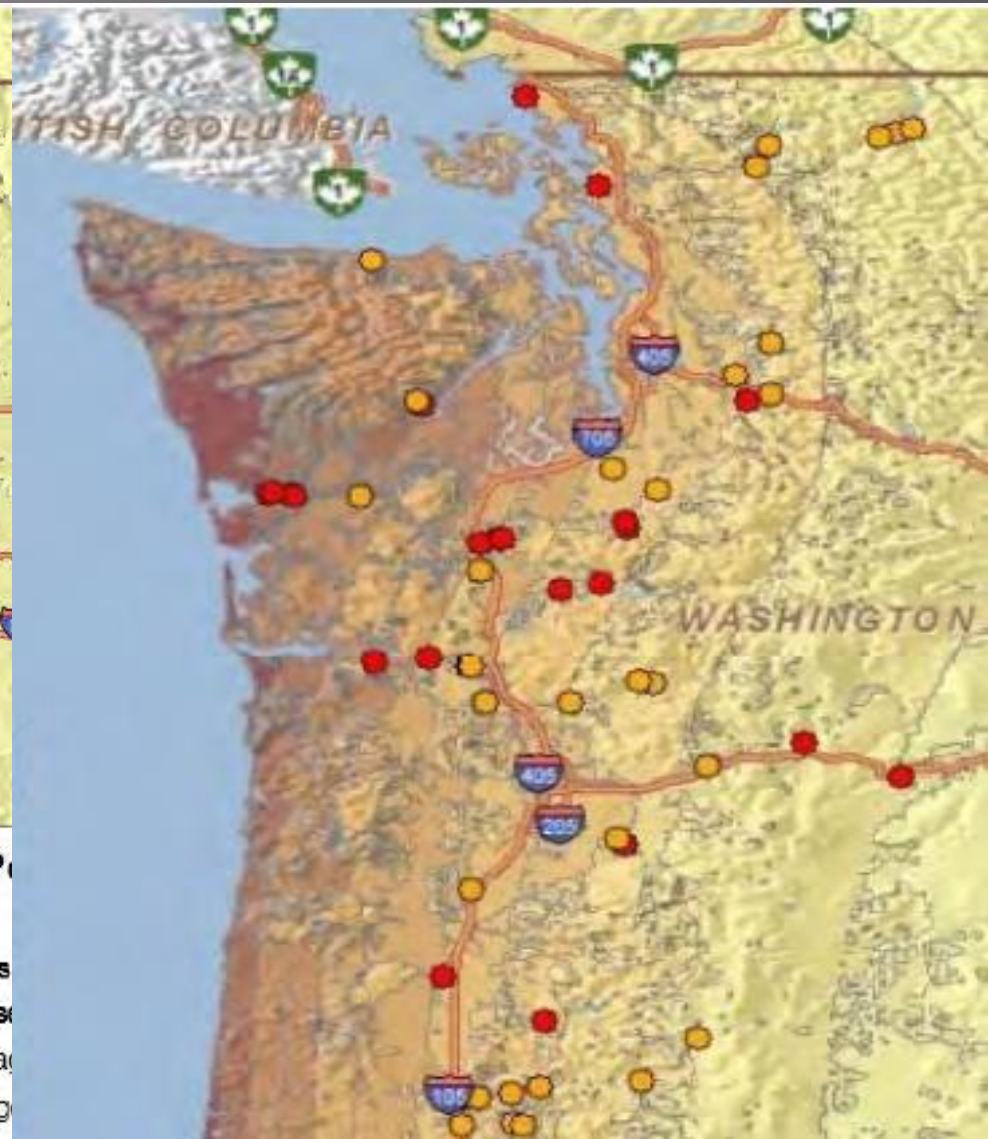
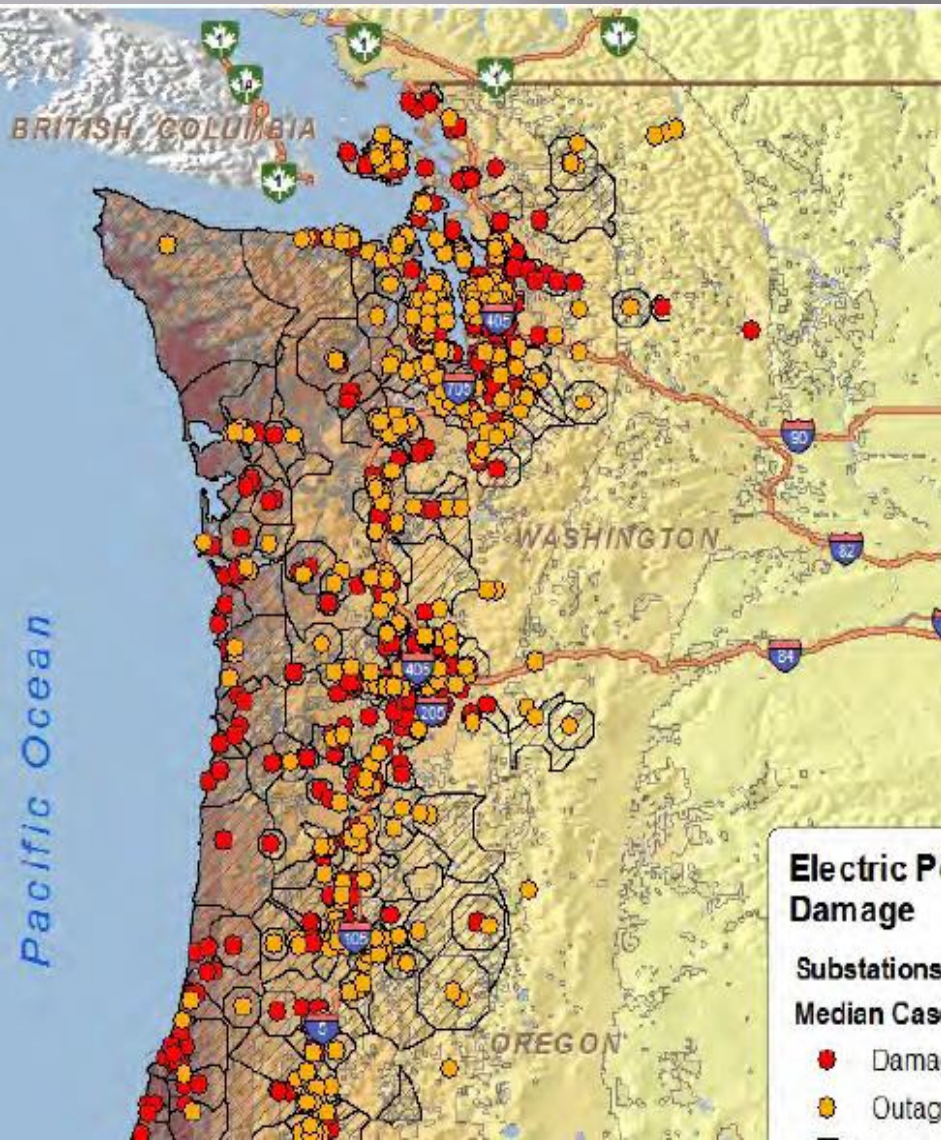
Allows us to deliver the services or products we provide as constructive members of society

# SECONDARY EFFECTS IMPACTING RESPONSE

## Mid- Term (15-270 days)

- Substandard roads will reconnect regions
- Scale exceeds federal capacity to respond
- Prioritization of utility restoration & rebuilding
- Health systems struggle to regain capacity
- Travel restrictions and fuel rationing continue
- 10s thousands in shelters/camps incl schools & parks
- Neighborhoods demand restoration of utilities
- Additional buildings damaged by aftershocks
- E. WA staging transit & evac centers expand
- Family reunification requires major effort
- Processing mass fatalities is extensive effort
- Business resumption very difficult
- Cascading effects continue to hamper restoration

# Power substations & Generators Median Case



# LONG-TERM EFFECTS

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- The local cultural, business and political environment will be drastically altered to a 'new normal' hard to predict
- Road rebuilding will take a decade
- Regulatory environment will affect recovery
- Business recovery will take a decade or more
  - High 'turnover' in small business
  - Lost contracts difficult to recover
  - Some business will relocate to survive
- Recovering built environment will prompt political debates/delay with competing visions
- Tax base contracts affecting bonding and gov't operations
  - Contracts and agreements renegotiated
- Intermediate housing creates a new residential model unless transition planned
- Accountability risk managing recovery project funds

# Recovery Planning

- An emerging discipline
- DHS has recently published the National Disaster Recovery Framework
- An individual assigned at EMD to develop this concept and integrate with local planning
- Very complex
  - Starts with assumption of a 'new normal'
  - Invites alternative visions of development
  - In WA GMA & local jurisdictions are determinants

# Summary

If or when a catastrophe happens in Washington, the duration and significance of long term effects, the health of our residents and our overall ability to respond and recover will depend on effective partnerships we create and sustain between jurisdictions, non-governmental and volunteer organizations and private individuals and businesses. These partnerships are vital to bringing the maximum amount of resources, energy, creativity and empathy to bear on an overwhelming disaster so that together the people of Washington State can rebound and thrive and contribute in turn to the welfare of our neighbors.